Sjöstrand's interest, in contrast, was quantitative – to determine with precision the size of cellular components so as to support models of the molecular architecture of membranes. This difference was manifest in their respective papers at the Third International Conference on Electron Microscopy, held in London in July, 1954. Sjöstrand asserted,

> The quantitative attitude is stressed because it is necessary for the identification and classification of the different components . . . The electron microscope is an efficient measuring device making an exact quantitative description possible, provided it is mastered to give high resolution. (1956b, p. 35)

Rasmussen argued that for this reason Sjöstrand showed only micrographs of mitochondria arrayed longitudinally. In that position the membrane would be perpendicular to the electron beam, and the micrograph would reveal the true width of the membrane. Palade, in contrast, judged the methods of electron microscopy insufficiently reliable to support quantitative conclusions:

> It seems, therefore, that the dimensions and spacings shown in fixed material by the electron microscope cannot be considered sufficiently true to nature to permit us to deduce the chemical composition and molecular architecture of a certain structure by finding out, as recently proposed (Sjöstrand, 1953a, b), which particular kind of molecule would best fit a given spacing. (1956c, p. 132)

The dispute between Sjöstrand and Palade also turned on the question of how to evaluate the accuracy of micrographs. For Palade, the critical criterion was consilience with results from other techniques, both other forms of microscopy and fractionation studies.[35] Palade claimed that Sjöstrand's criterion was the detail in the micrograph itself:

> Sjöstrand is of the opinion that fixation tends, in general, to disorganize the cytoplasm s;, in comparison with the situation *in vivo*, no structure is added, but structure may be subtracted. Accordingly the best fixative is considered to

[35] Rasmussen (1995) maintained that Palade's strategy undercut the ability of electron microscopy to conflict with biochemical results: "Palade removed virtually all potential for conflict between the evidence from electron microscopy and that from biochemistry. The two experimental approaches spoke to separate domains: the former to questions of arrangement; the latter to questions of molecular structure and function" (p. 400). Sjöstrand, on the other hand, by proposing to use precise measurements so as to assess the molecular structure of membranes, set up the potential for results that conflicted with biochemistry. The fact that Palade's approach supported and did not threaten biochemists, according to Rasmussen, turned them into allies and helped insure greater success for his approach over that of Sjöstrand: "I would suggest that it was the different kind of relationship that Porter and Palade designed with biochemistry that ultimately made electron microscopic cytology of the Rockefeller school the dominant configuration" (p. 419).